Aquaculture/Hydroponics

Course Description: The student will explore the fastest growing field in the agricultural industry. Producing food in a water environment to meet the needs of today's increasing population includes raising shrimp, tilapia and shellfish. The hydroponics area includes growing various fruits and vegetables without the use of soil. Students will learn how to address issues such as using less space for food production, water management, including testing for water quality, dissolved oxygen, pH, and ammonia.

Recommend Prerequisites: Agriscience, Principles of Agricultural Sciences, or Principles of Horticultural Sciences

Recommended Credit: 1

Recommended Grade Level: 10th, 11th, or 12th

Course Codes:**   A10 – **5109** or A12 - **5159**

** Use A12 Course Code number for all programs. A10 should be used for 10 month programs only.

Aquaculture/Hydroponics

Standard 1.0

Evaluate the significance of aquaculture and hydroponics technology.

Standard 2.0

Evaluate specific species of plants and animals for production.

Standard 3.0

Evaluate the parts of aquatic plants and animals.

Standard 4.0

Analyze different management techniques used in producing fish.

Standard 5.0

Assess basic health and nutritional requirements for fish.

Standard 6.0

Examine water chemistry and the role it plays in water quality for production.

Standard 7.0

Evaluate structures and equipment used in production facilities.

Standard 8.0

Examine methods of producing hydroponic crops.

Standard 9.0

Evaluate the marketing process and development of a business plan.

Standard 10.0

Demonstrate premier leadership and personal growth needed for careers in aquaculture.

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Standard 1.0
Evaluate the significance of aquaculture and hydroponics technology.
Learning Expectations and Performance Indicators:
1.1   Investigate the history of aquaculture and the common production systems in the world.
1.2   Investigate the history of hydroponics and the common production systems in the world.
1.3   Evaluate the importance of aquaponics and its evolution as an industry of agriculture.

Standard 2.0
Evaluate specific species of plants and animals for production.
Learning Expectations and Performance Indicators:
2.1   Compare and explain species of animals grown in aquatic environments.
2.2   Compare and explain species of plants grown in aquatic environments.
2.3   Relate environmental conditions to aquatic life.

Standard 3.0
Evaluate the parts of aquatic plants and animals.
Learning Expectations and Performance Indicators:
3.1   Differentiate the parts of aquatic animals.
3.2   Differentiate the parts of aquatic plants.
3.3   Discuss physiological differences in aquatic plants.
3.4   Discuss physiological differences in aquatic animals.

Standard 4.0
Analyze different management techniques used in producing fish.
Learning Expectations and Performance Indicators:
4.1   Justify the function of a hatchery.
4.2   Summarize spawning and breeding activities for aquatic life.
4.3   Specify and explain the different stages of fish growth (fry, fingerling, food sizes and brood fish).
4.4   Summarize the types of aquaculture systems (indoor and outdoor), bait, food, sport and ornamental.
4.5   Recommend species of fish that can be grown in Tennessee.

<u>Standard 5.0</u>
Assess basic health and nutritional requirements for fish.
Learning Expectations and Performance Indicators:
5.1   Specify nutritional requirements for aquatic animals.
5.2   Calculate intake needs of fish.
5.3   Evaluate different types of feeds.
5.4   Outline fish health management practices.

<u>Standard 6.0</u>
Examine water chemistry and the role it plays in water quality for production.
Learning Expectations and Performance Indicators:
6.1   Determine water quality factors.
6.2   Recommend and justify methods and chemicals needed to change water quality.
6.3   Perform common tests on water for production.
6.4   Use the correct mathematical equations to determine fertilizer, feed, and chemical proportions and water volume measurements.

<u>Standard 7.0</u>
Evaluate structures and equipment used in production facilities.
Learning Expectations and Performance Indicators:
7.1   Evaluate structures used in production.
7.2   Recommend equipment to be used in production hydroponics.
7.3   Recommend equipment to be used in production aquaculture.
7.4   Research new methods, structures and equipment being used experimentally.

<u>Standard 8.0</u>
Examine methods of producing hydroponic crops.
Learning Expectations and Performance Indicators:
8.1   Compare different types of growing media.
8.2   Compare different types of production systems.
8.3   Discuss the nutritional requirements of hydroponic crops.
8.4   Identify crops that could be grown hydroponically.

<u>Standard 9.0</u>
Evaluate the marketing process and development of a business plan.
Learning Expectations and Performance Indicators:
9.1   Evaluate the basic business principles of supply and demand.
9.2   Demonstrate sales and marketing techniques necessary to run a successful business.
9.3   Demonstrate recordkeeping and financial management skills showing profit-loss ratios.
9.4   Demonstrate favorable supervisory skills necessary to manage a hydroponics operation.
9.5   Investigate the regulatory laws and agencies that the aquaculture and hydroponics industries must work with in conducting business.

Standard 10.0
Demonstrate premier leadership and personal growth needed for careers in aquaculture.
Learning Expectations and Performance Indicators:
10.1   Demonstrate public speaking abilities through oral presentations and participating in career development events.
10.2   Recommend supervised agriculture experience program projects that relate to aquaculture.
10.3   Develop public relations and citizenship skills necessary to be productive in aquaculture careers.
10.4   Develop work ethics and team building skills used in industry today.